

A detailed, high-contrast black and white photograph of industrial machinery, likely a lathe or mill, showing various metal components, bolts, and a central rotating part. The lighting creates strong highlights and deep shadows, emphasizing the metallic textures and complex geometry of the machine.

EDS-Mechanical Solutions

Capabilities presentation - Casting & Forging Introduction

23 pages
Version 1.0

Engineering

Design

Supply



M E C H A N I C A L S O L U T I O N S

Our mission

By being resourceful we create the perfect fit in mechanical solutions. In close cooperation with our customers our dedicated team delivers the highest level, cost-efficient product in the supply chain.



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EDS - MECHANICAL SOLUTIONS
 Specialised in engineering, design and supply of innovative solutions, castings and forgings

Our capabilities

- 1 Finding opportunities for cost reduction
- 2 Investigating product management & failure
- 3 Design & Engineering in general
- 4 Design & Engineering of castings & forgings
- 5 FEA & CFD simulation
- 6 Casting process simulation
- 7 Reverse engineering
- 8 Prototyping
- 9 Selecting the perfect supplier
- 10 EDS-Sensor technology



Workflow process

Our standardized (modular) process resulting in an appropriate solution





1:1 conversion



Optimisation & weight reduction

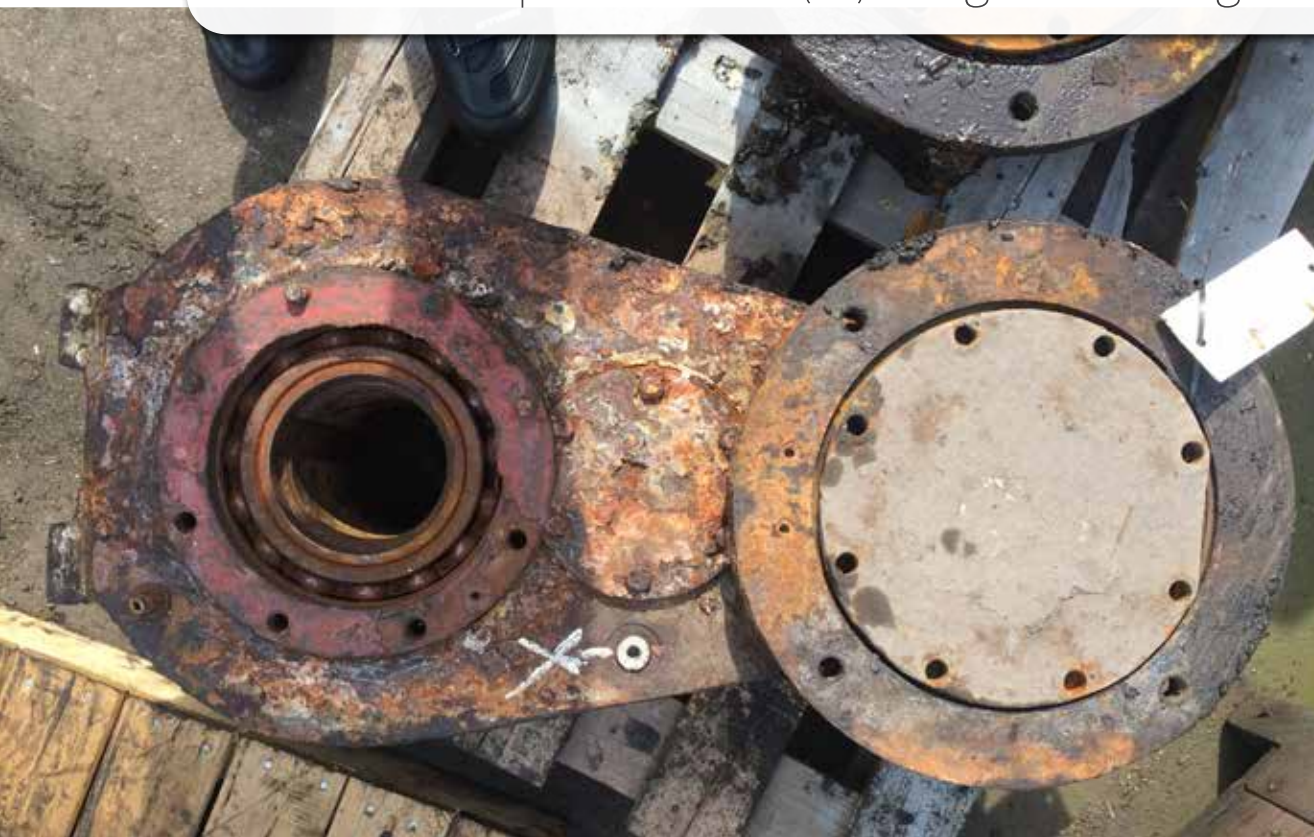


Improving assembly
Increasing volume



DESIGN & ENGINEERING

Product optimization, (re)design, reducing assembly steps, cost reduction, et cetera.



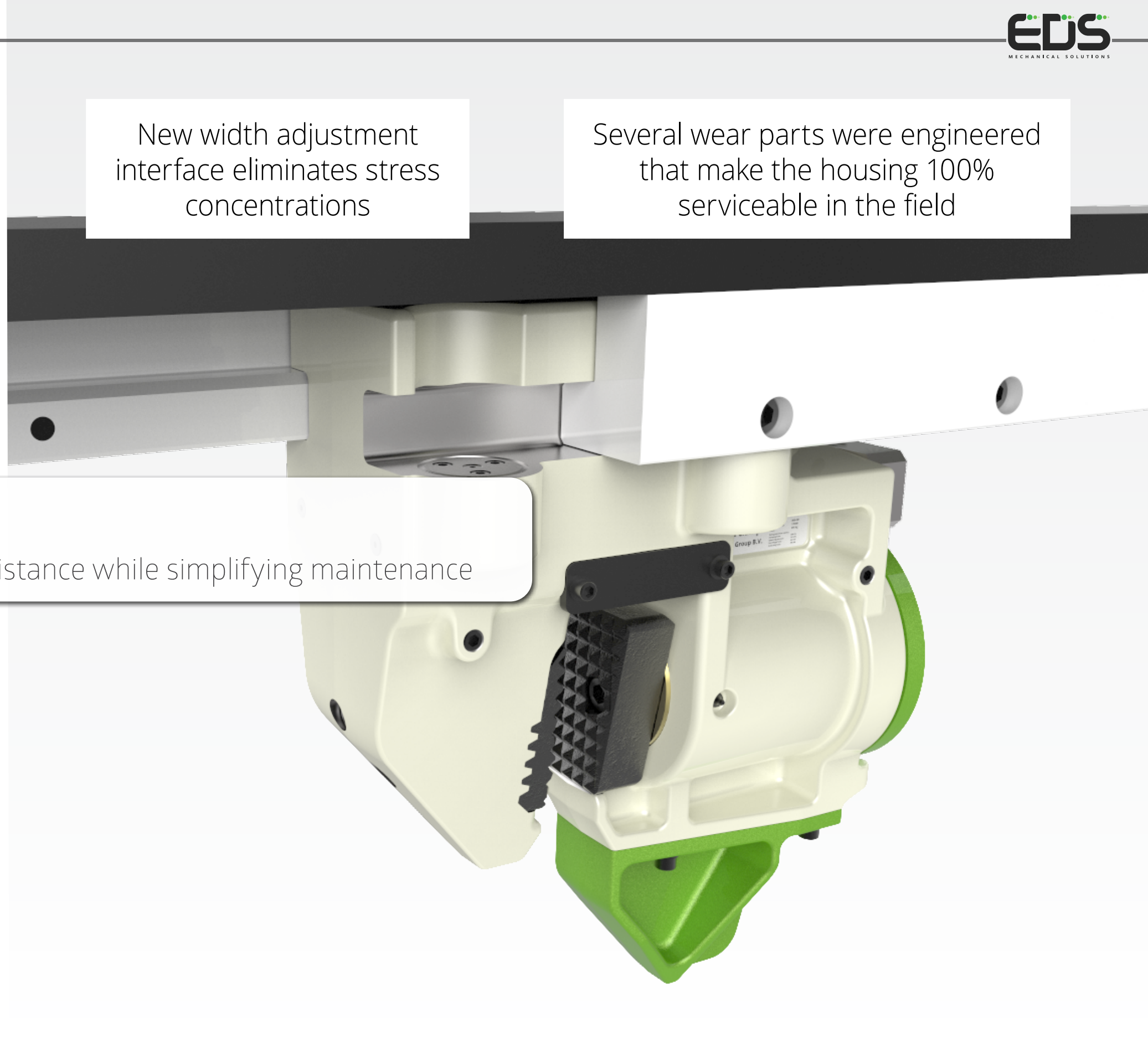


New width adjustment interface eliminates stress concentrations

Several wear parts were engineered that make the housing 100% serviceable in the field

DESIGN FOR FATIGUE

Investigating failure and increasing fatigue resistance while simplifying maintenance



Improving the lifespan through material changes and geometric adjustments

DESIGN FOR WEAR AND TEAR

Investigating failure and increasing wear resistance



Original: Welded

Solution: Casting

Different concept designs for outside geometry in Ni-Resist alloy

Internal sand cored channel eliminates machining and welding



INCREASING BEARING LIFE-TIME

Concept proposal for application of heat- and corrosion resistant iron alloys and complex sand-cores

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Material optimization

Supply of cost-efficient part with better corrosion resistant material

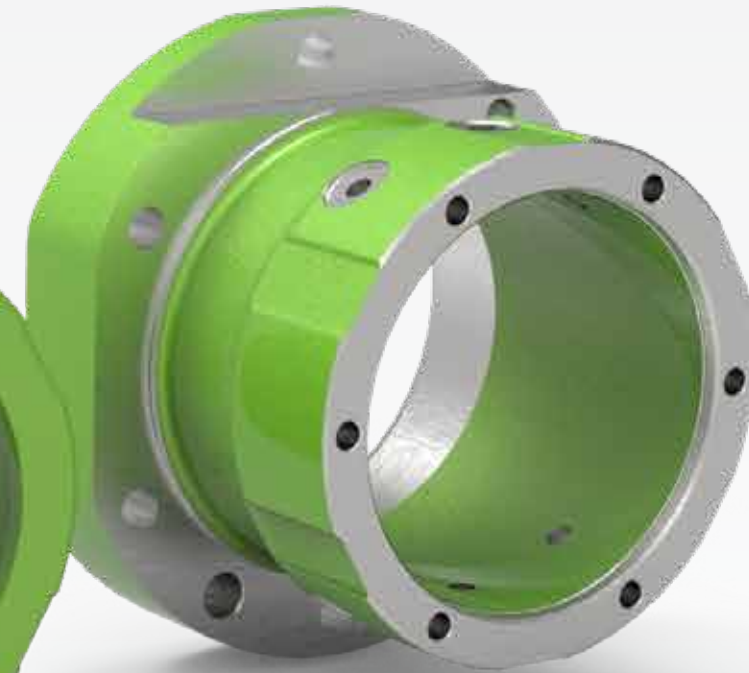
Original: S355JR, Nickel plated



Casting: X5CrNiMo17-12-2



Casting after machining



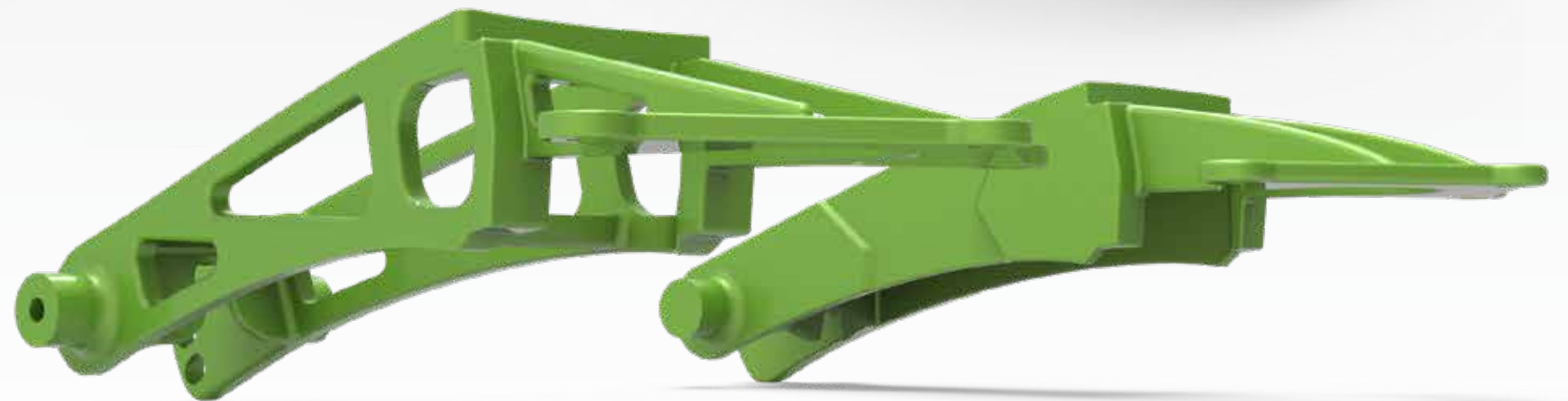


DESIGN FOR ANNUAL VOLUME

Production evolution: small-series welded steel, medium-series investment steel lost wax, high series aluminium permanent die casting



Version 0



Version 1

Version 2

DESIGN FOR REFURBISHING

Product proposal for cost reduction, eased maintenance and less waste of materials



Forged hammer body in wear resistant steel



Reusable roll body with separate replaceable rings

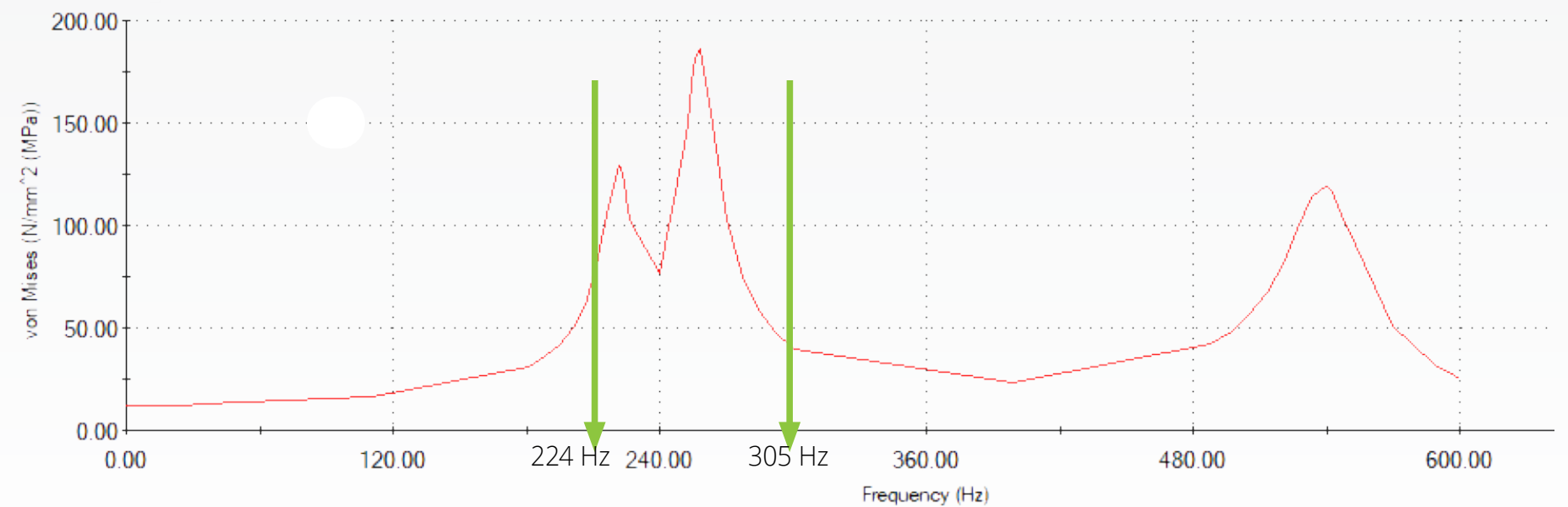
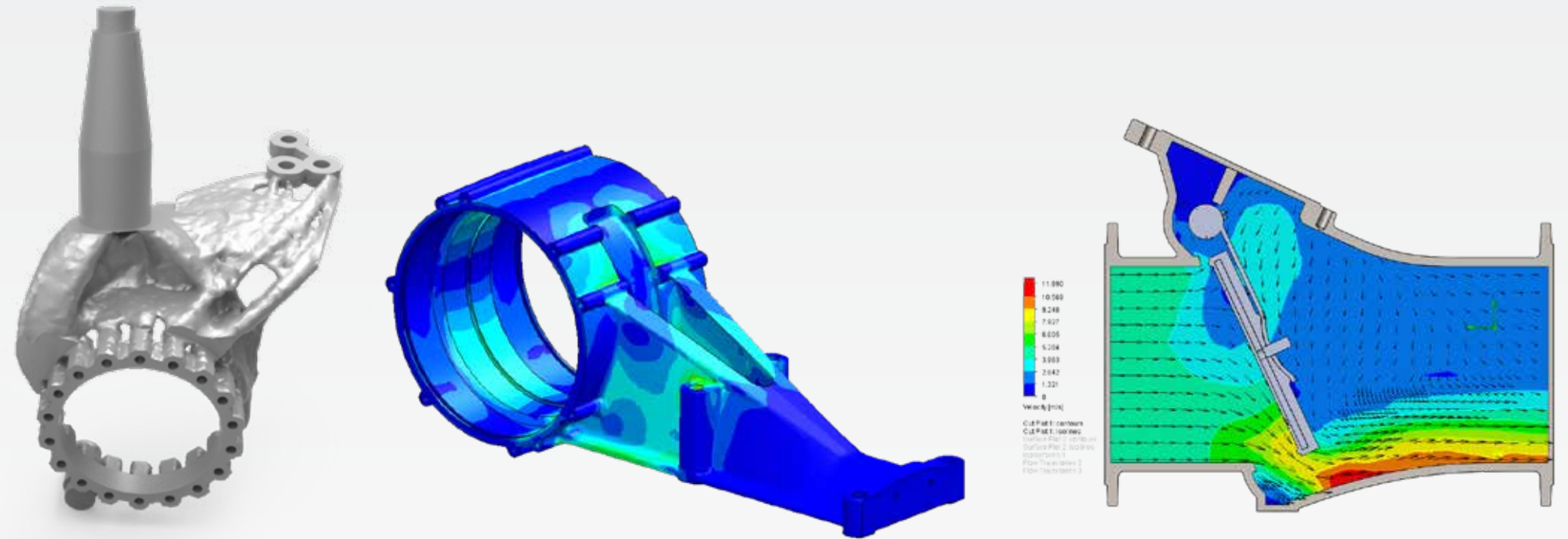
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Design optimization

Improving design by using
FEA & CFD simulation.

Examples include

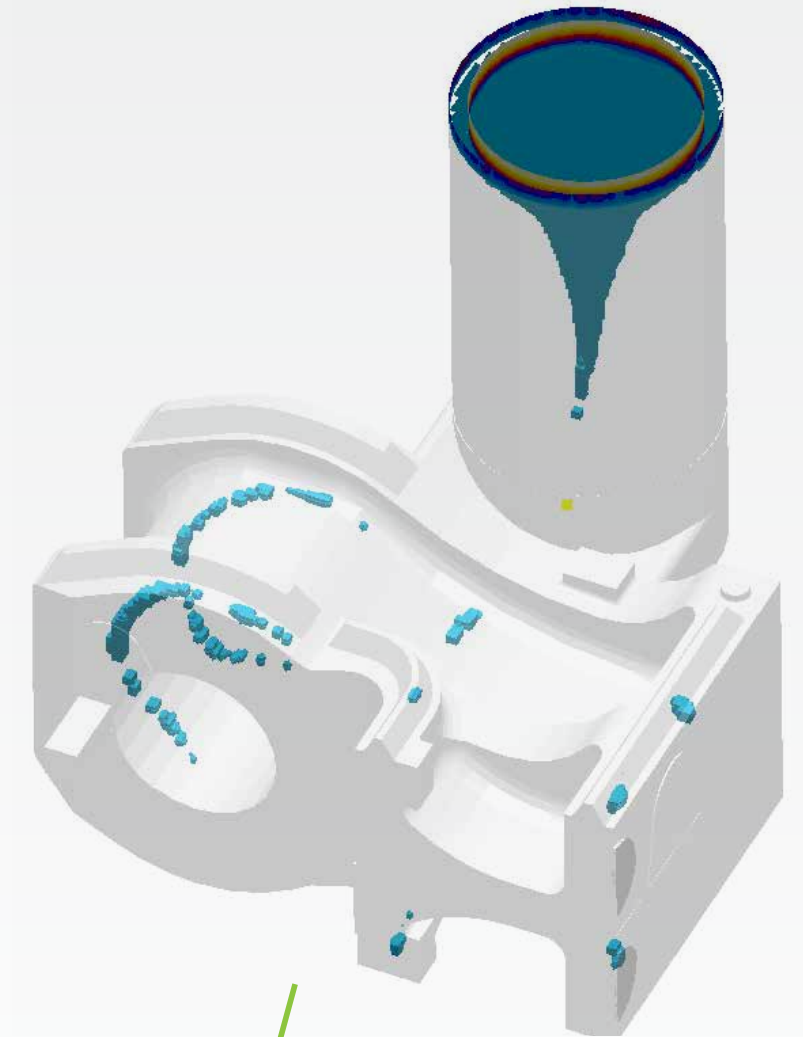
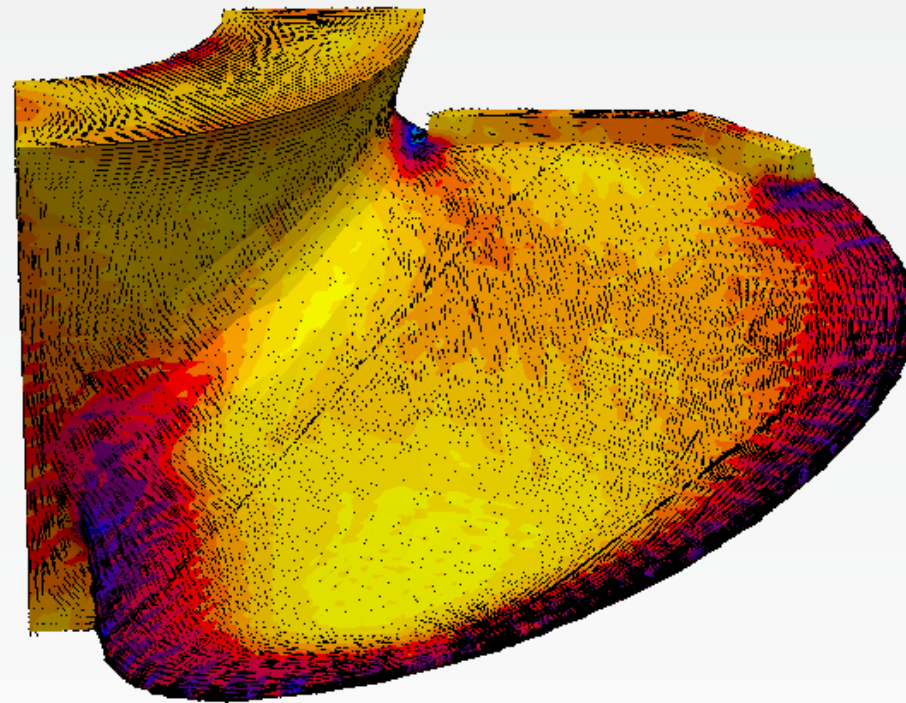
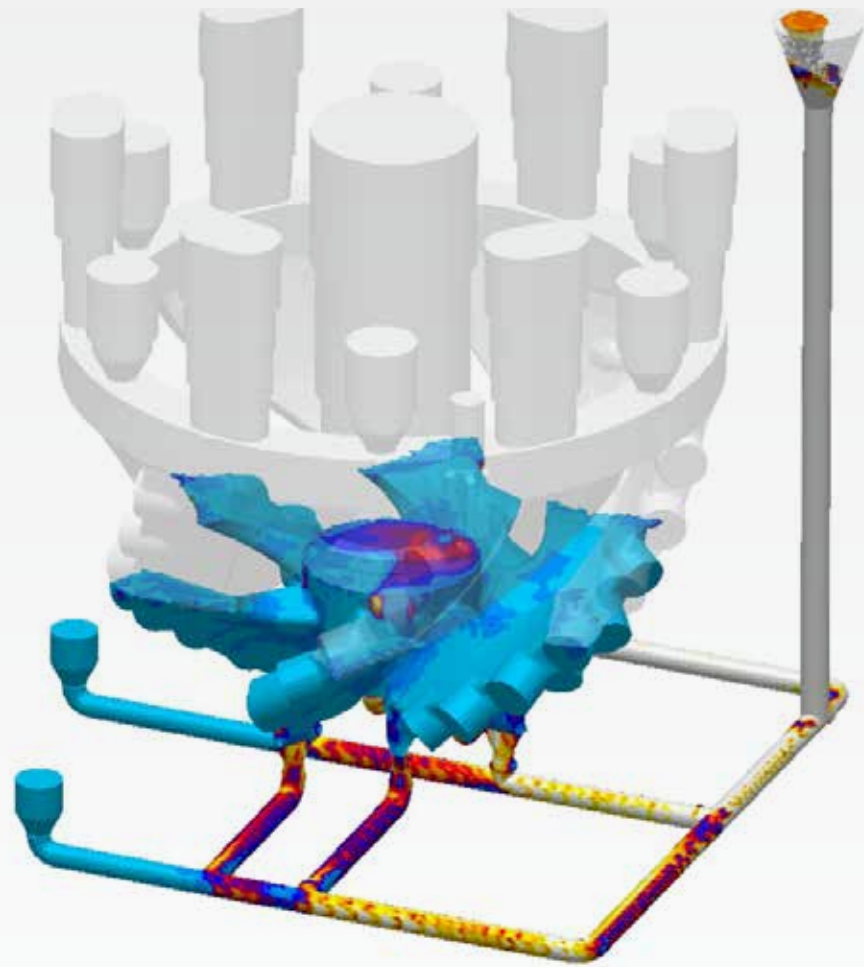
- Linear static stress analysis
- Non-linear static stress analysis
- Dynamic analysis
- Modal analysis (frequency)
- Thermal analysis
- Fatigue analysis
- CFD analysis (fluid flow)
- Topology optimization



Filling
(velocity)

Thermal stresses
(Von mises)

Solidification
(Porosity)

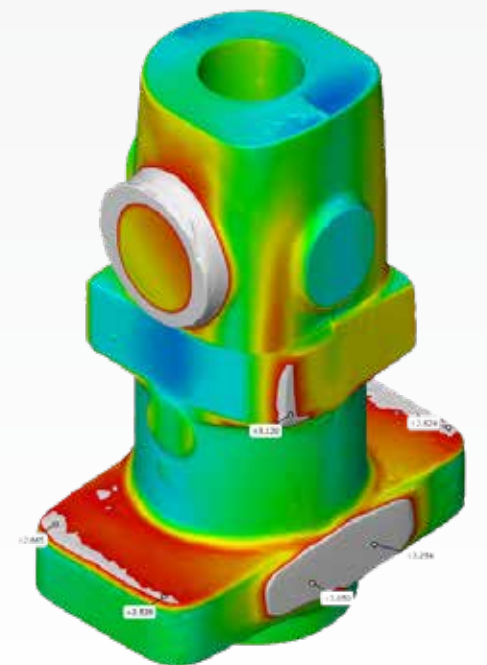
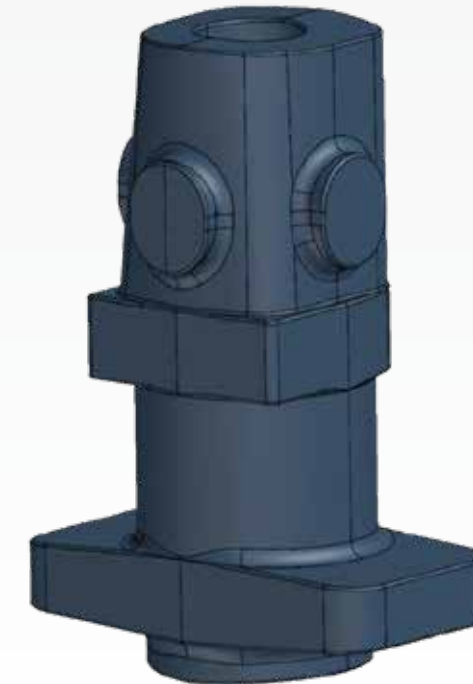
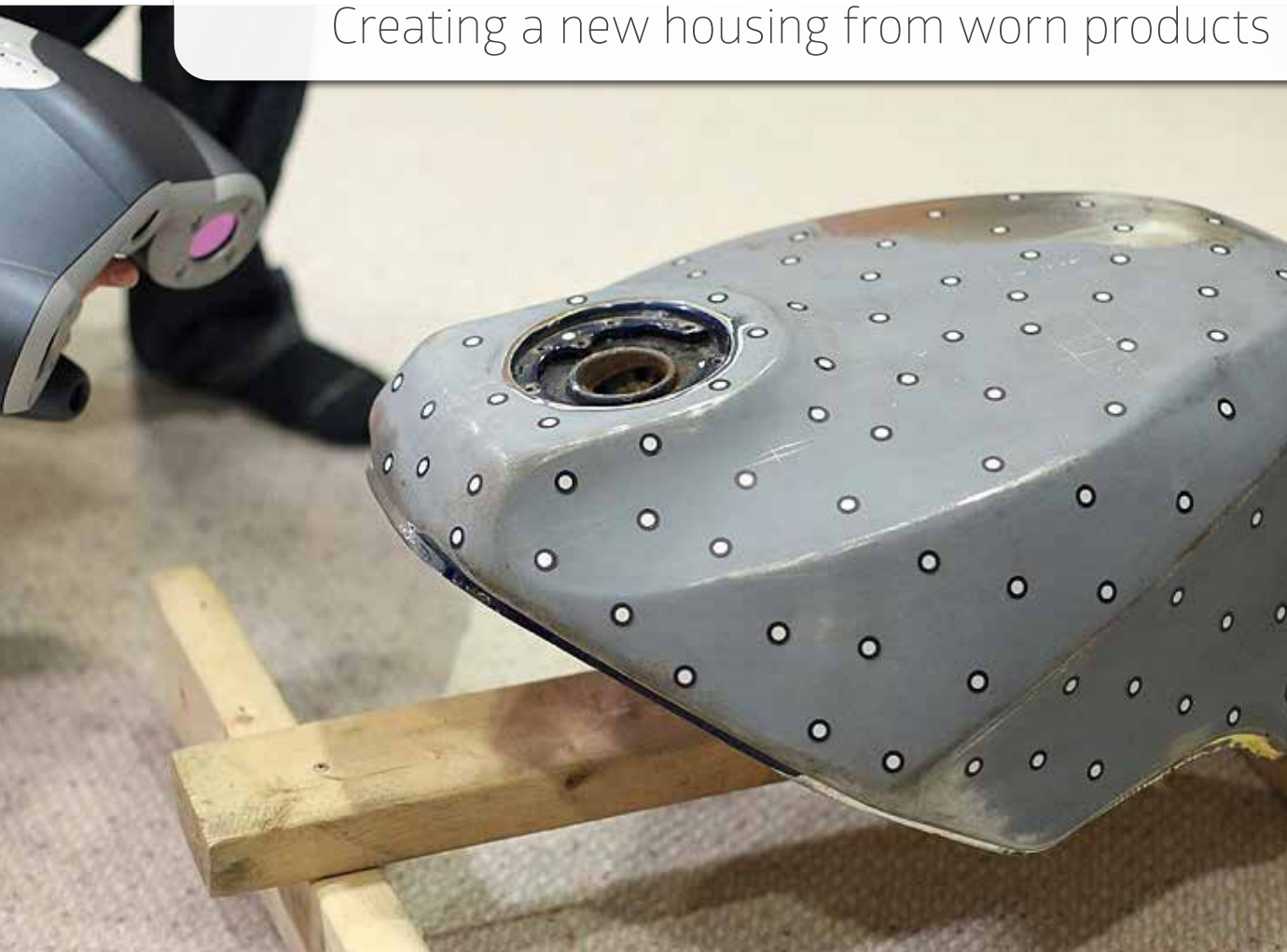


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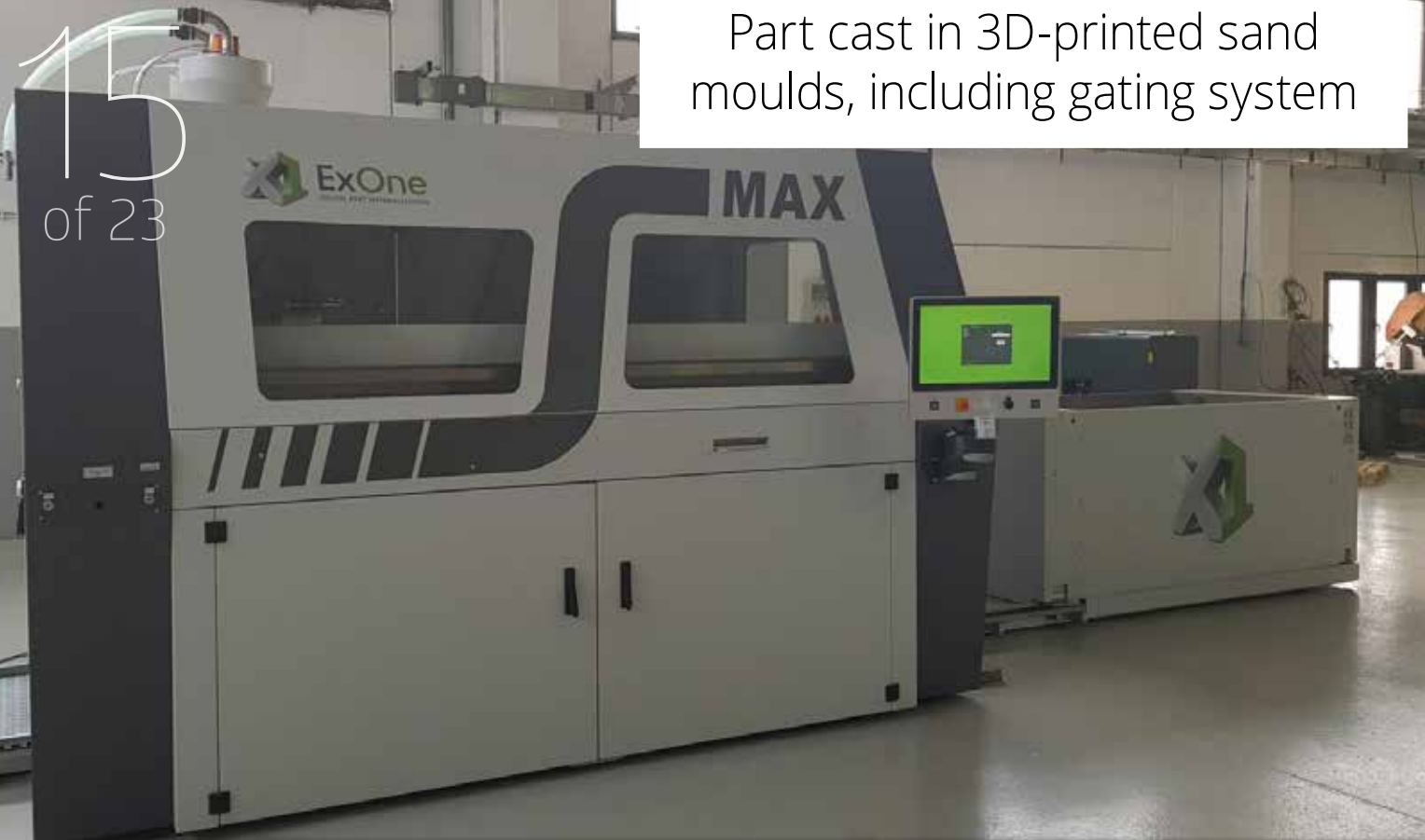
Blue light scanning
for accuracy up to
 $\pm 0,1\text{mm}$

REVERSE ENGINEERING

Creating a new housing from worn products

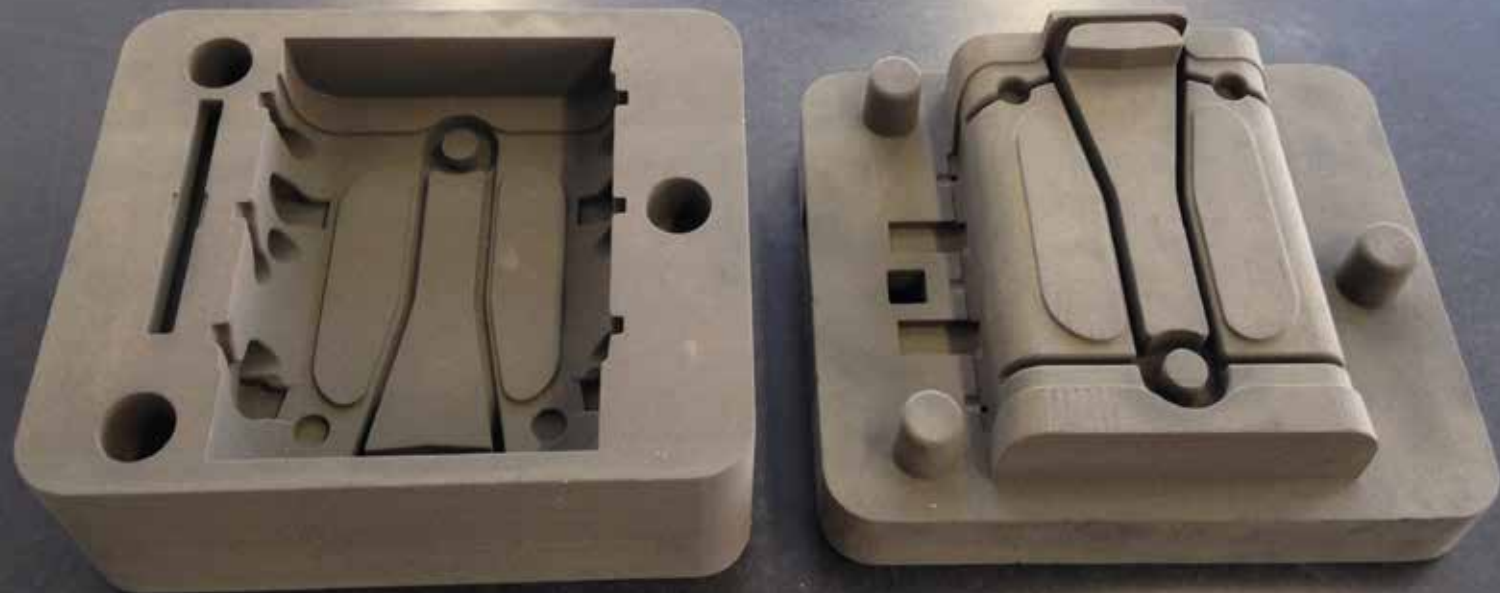


Part cast in 3D-printed sand moulds, including gating system



PROTOTYPING WITH ADDITIVE MANUFACTURING

Sand casting starting from 1 piece with 3D-printed moulds



Final parts were tested in the field to validate FEA calculations

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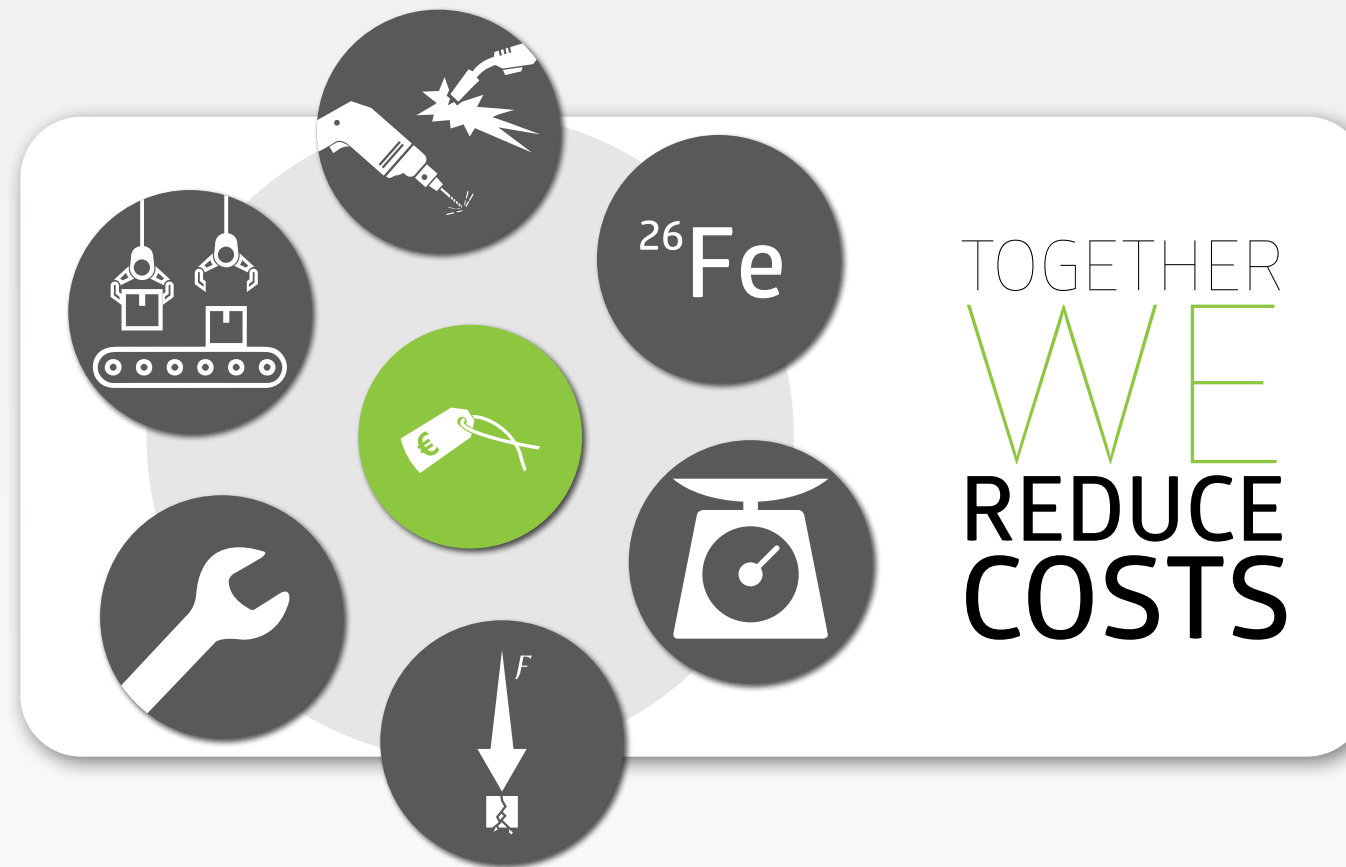
Continuous monitoring via IoT

Internet of Things enables to create devices that monitor part performance

All sensors can be connected, e.g. flow, acceleration, temperature, speed, moisture, GPS and strain sensors

Purpose (and custom) built device to gather sensor information wirelessly





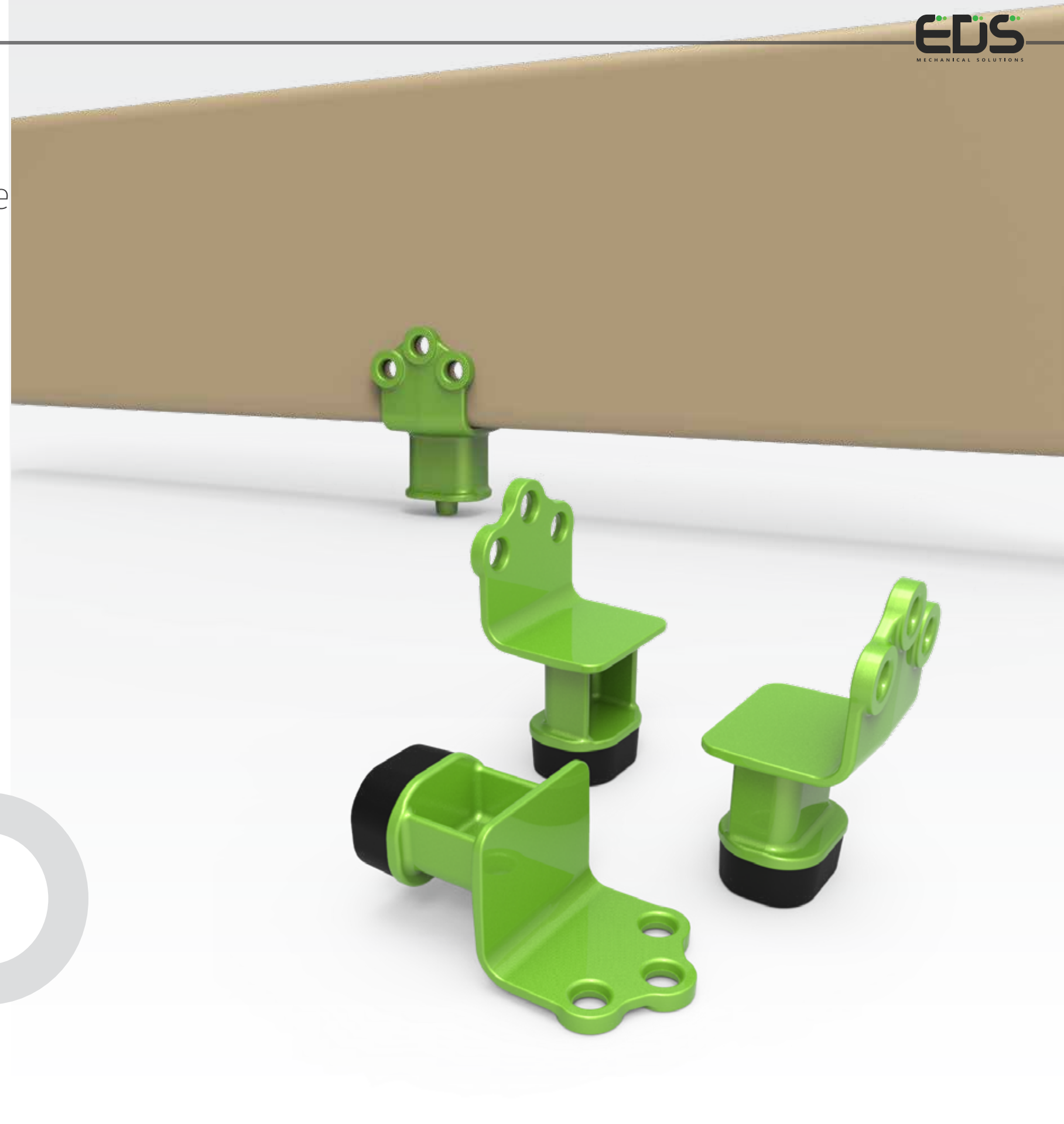
EXAMPLE PARTS

Three project EDS has done for three different clients

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Vulcanized Bump stop

Rubber & Casting combination for a front axle



RESULTS



24 % Weight reduction

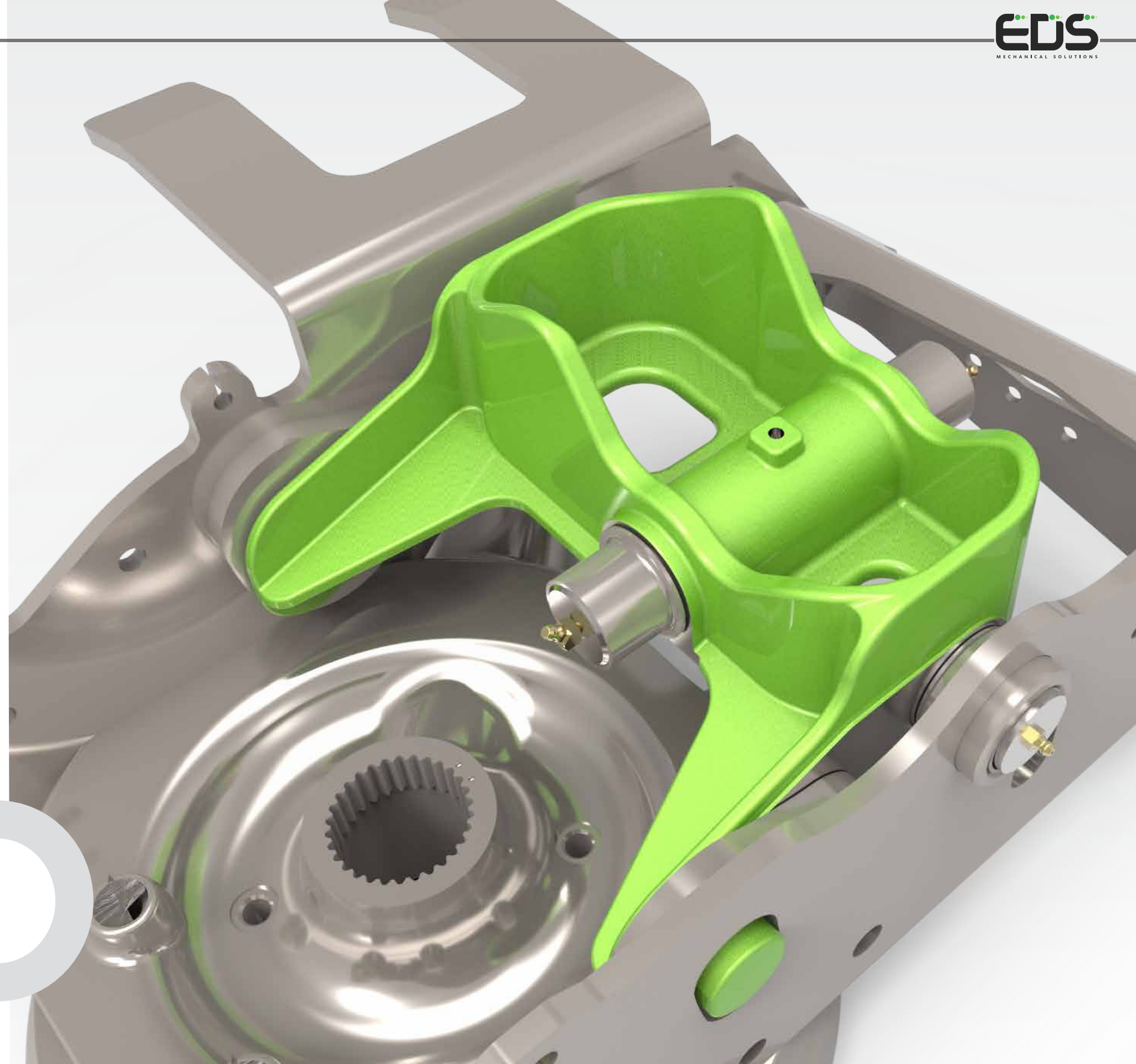
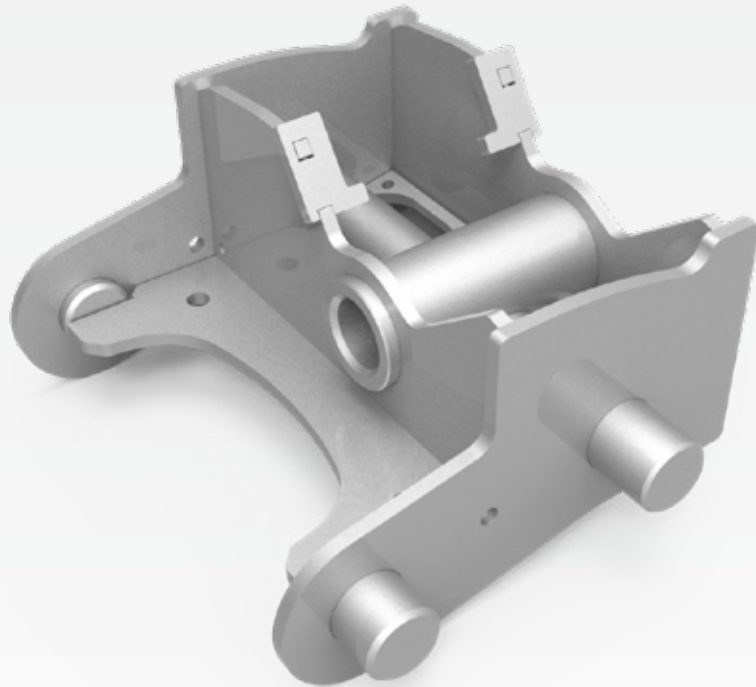


43 % Cost reduction

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Cardanic Joint

Of a big rake machine



RESULTS



30 % Weight reduction

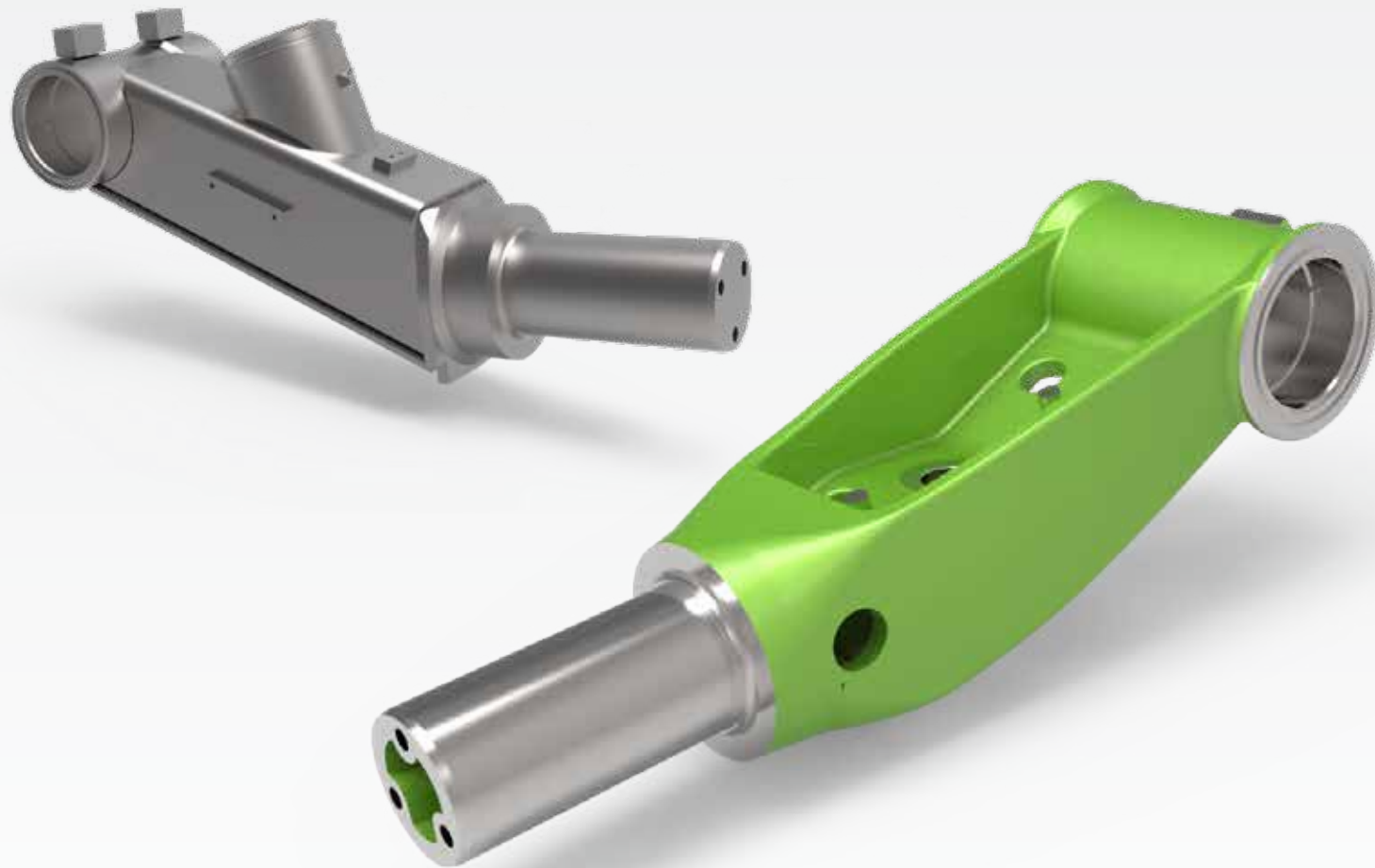


59 % Cost reduction

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Rocker arm

Component of a height adjustment and steering system for heavy duty semi-trailers



RESULTS



17 % Weight reduction



38 % Cost reduction

IN SHORT



TOGETHER
WE
REDUCE
COSTS

OUR UNIQUES

- We think along with all parties
This allows us to offer the best optimized parts for the best price.
- We see opportunities for improvement
In the supplychain that the customer does not see or expect.
- We unburden
We can be the one stop shop partner from application to supply.

OUR GUARANTEES

- > 10% cost reduction and/or functional improvement
- Return on investment within 1 year
- Included aftersales service

How can we help **you**?



TOGETHER
WE
REDUCE
COSTS



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